PROSTATIC OBSTRUCTION—DEVELOPMENT OF ITS SURGICAL TREATMENT*

By HERMON C. BUMPUS, JR., M. D.
Rochester, Minnesota

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COMMENT

SO convinced have I become that preliminary drainage should be confined to cases in which the renal function must be improved or urinary infection diminished, that I have never hesitated to remove through the urethra the obstructing portion of the hypertrophied gland, if the renal function was normal and acute prostatitis absent, as soon as the diagnosis was established. Preliminary treatment, except to improve renal function or reduce infection, is a useless waste of the patient's time and may make him much worse. In approximately a fifth of the cases to be reported in this paper no preliminary preparation was given, yet no difference was noted in their postoperative course from those receiving preliminary drainage. Much as this changed conception regarding the importance of preliminary drainage diminishes the time necessary for the correction of urinary obstruction from prostatic enlargement, it is insignificant when compared to the time saved by the employment of transurethral methods as compared with perineal or suprapubic prostatectomy.

This newer method of treatment is based, it would seem, on the firmest of logical grounds, for it aims at the removal of the obstructing portion only and not the entire enlargement.

Young's Punch.

The development of the material in America dates from Young's presentation of his prostatic punch in 1911, at which time he stated: "The amount of tissue removed at suprapubic operation is often so small that it seems ridiculous to have to perform a suprapubic operation for its removal." Although the instrument did much to stimulate transurethral work in America, its use in any but median bar and obstruction of the contracted neck of the bladder was impossible because of lack of adequate vision and failure to provide any means of hemostasis. Braasch, in 1918, described his median bar excisor, which permitted adequate vision but also failed to provide for hemostasis, and so was limited in its application.

Caulk's Modification.

Caulk, in 1920, presented a modified Young punch in which hemostasis was provided by substituting a cautery blade for the tubular knife of the older instrument. Although Caulk's instrument was faulty in vision, the control of bleeding was a long step forward, and he must be given credit for keeping the attention of members of the profession centered on the problem of transurethral resection, and for demonstrating, in spite of most adverse criticism, that the relief of obstruction is feasible in many cases. While using Caulk's instrument in a series of seventy-two cases, I noticed that the procedure was likely to be followed by an acute febrile reaction that generally subsided on the fourth or fifth day but which was sometimes unduly prolonged. Following the use of the knife punch, such reactions had been the exception. It appeared, therefore, that a cauterized area in the neck of the bladder was more prone to secondary infection than a cleanly incised area. The interval required for healing a burn in comparison with healing a clean incision seemed about to double the time over which such an infection might take place. This fact led me to abandon the instrument and to use in its place a Braasch cystoscope of the same caliber as the Caulk instrument, in the barrel of which a fenestra similar to the Caulk instrument had been cut.

Author's Modification.

This instrument gives adequate vision of the operative field so that one can determine what portions of the obstructing tissue to remove first and what their relative size and position is to almost all anatomic landmarks, such as the verumontanum, ureteral orifices, and interureteric ridge. Vision is adequate and there is no difficulty in removing whatever obstructing tissue is necessary.

To control bleeding I at first removed the instrument and replaced it with a cystoscope, and with a flexible electrode lightly electrocoagulated the bleeding areas and touched each large arteriole which could be seen spurting in the irrigating fluid.

Since then the instrument has been modified in construction so that a multiple needle electrode is thrust into the tissue before the knife is passed, and so renders the course of the knife blade through the tissue more or less bloodless and reduces to a minimum the necessity of electrocoagulation of the tissue after excision. This procedure had been employed by both Day and Kirwin in a somewhat modified form, since in their instruments the coagulation is more extensive.

Other Instruments.

While these changes were being developed in the direct vision instrument, Stern was perfecting a lens instrument with which the obstructing tissue was resected by a reciprocating wire loop through which a high frequency current was passed. This instrument was later popularized by Davis, who demonstrated the possibilities of this form of resection and to whom most credit is due for the progress of transurethral resection during the last few years.

Following Davis's success, McCarthy produced his panendoscope, which is unexcelled as respects vision, and is equipped with a reciprocating loop which reaches out beyond the end of the instrument and resects the tissue as it is drawn back into the sheath. The loop is larger than in the original Stern instrument, therefore the operation can be carried on more rapidly. The instrument has become popular with urologists who prefer a lens instrument for doing this type of work.

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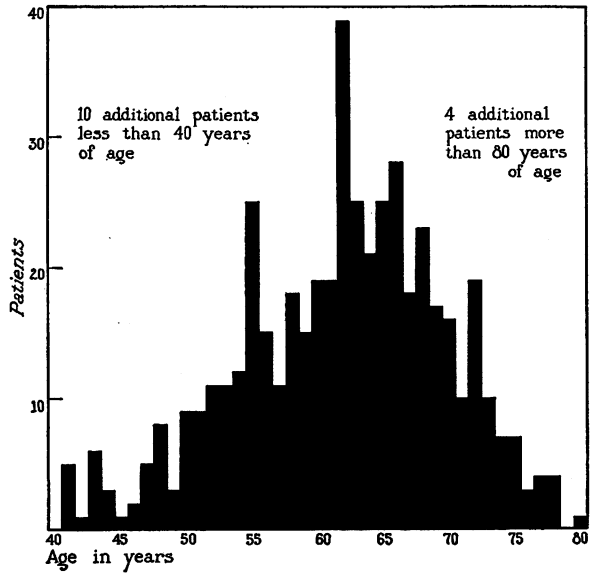

Fig. 2.—Ages of the 499 patients.

Other urologists, including Day, Cecil, Kirwin, and Foley, have developed instruments which, in the hands of their designers, have proved efficient.

PRINCIPLE OF THE OPERATIVE PROCEDURE

The method employed or the instrument used is not of great importance; the skill of the operator with whatever instrument he chooses is of far greater importance in determining success or failure. The principle of the procedure consists in removing in small pieces, under adequate vision and without the production of undue bleeding, all of the prostatic tissue which obstructs the urethra. If sufficient tissue is not removed completely to relieve the residual urine, an unsatisfactory convalescence is likely to occur. In such cases it is best to examine the patient after an interval of at least ten days. Usually it will be found that not sufficient tissue was removed originally, in which case the remaining obstructing tissue should be resected at once. In thirty (10.8 per cent) of the 276 cases in which operation was performed in 1932 at The Mayo Clinic, a second resection before the patient left the hospital was necessary to insure complete emptying of the bladder.

Critics of the method have stated that transurethral resection is open to the following objections: the results will not be permanent; fibroadenomatous hypertrophy having taken place the process will continue; the removal of only the obstructing tissue will of necessity be followed by the development of new obstructing tissue, and only by complete enucleation can this be corrected. In refutation of this contention Caulk has repeatedly called attention to the diminution in the bulk of a hypertrophied gland following the institution of suprapubic drainage. He holds that the same diminution occurs when the residual urine is removed; this is accomplished by rendering the patient capable of completely emptying the bladder by transurethral removal of the obstructing portion of the gland. That was demonstrated by 269 cases of adenomatous hypertrophy in which transurethral operation had been performed at the clinic since January 1, 1927. In only two patients was it necessary to perform subsequent prostatectomy; in only five was it necessary to remove further obstructive tissue at a subsequent date, and in sixteen of the cases the transurethral operation was undertaken to remove obstruction which developed after prostatectomy. Certainly this would indicate that the procedure gives as much hope of relief as does prostatectomy.

RESULTS WITH TRANSURETHRAL OPERATIONS

Since January 1, 1927, 545 cases of urethral obstruction from prostatic enlargement or deformity have been treated by transurethral methods at the clinic. In forty-six of these cases the obstruction was the result of contracture of the vesical neck, and good functional results were obtained by incision with the Collings electrode. As no tissue was removed, the operation has been classified as transurethral sphincterotomy. In 499 other cases, in which the average age was sixty-four years (Fig. 2), tissue was removed in amounts varying from 1 to 48 grams (Fig. 3). In forty-eight of these cases either a Stern-Davis or Stern-McCarthy instrument, employing the principle of the wire loop, was used; whereas in the remaining 451 cases the instrument previously described and developed in the urologic section of The Mayo Clinic was employed.

In the last two years larger and larger glands have been successfully dealt with. It has been found necessary to perform complete prostatectomy in only two patients during the last four months, during which period transurethral treatment has been carried out in 142 cases. The

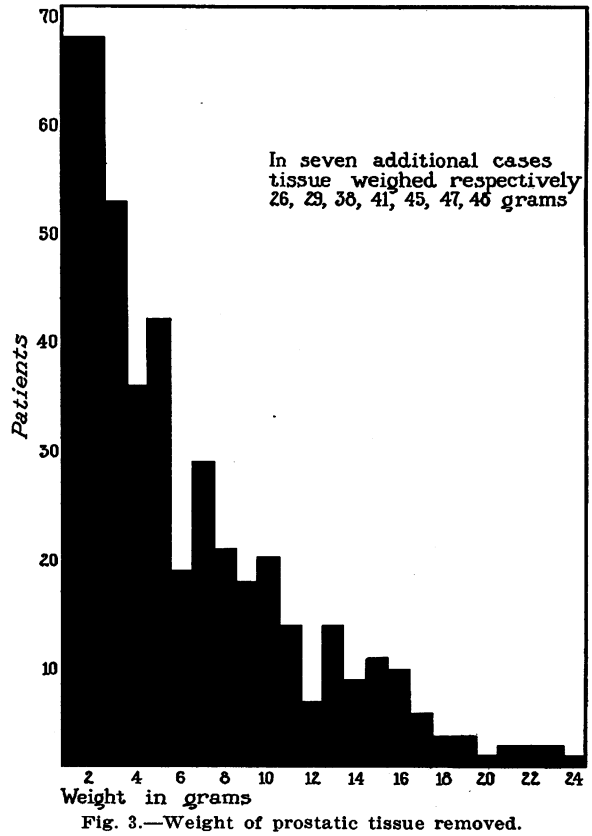

Fig. 3.—Weight of prostatic tissue removed.

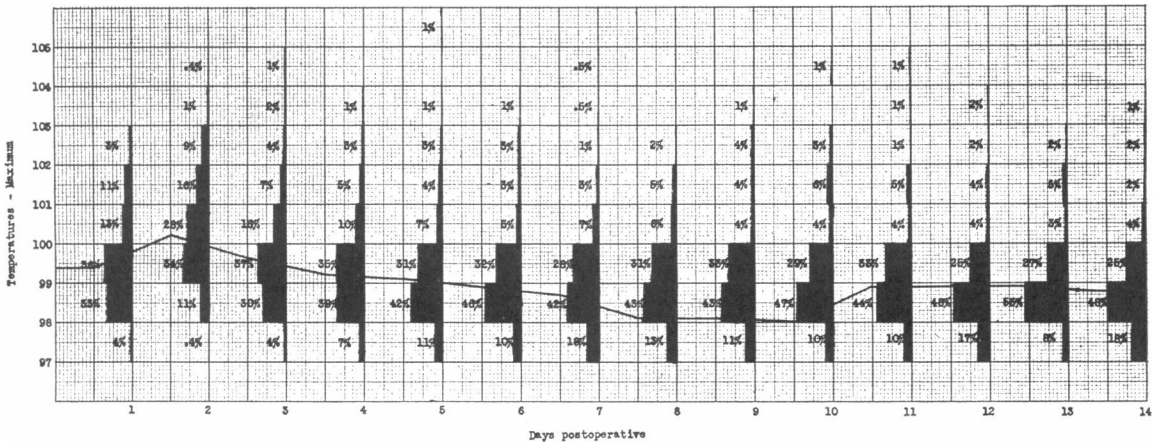

Fig. 4.—Maximal temperatures, Fahrenheit, on the different postoperative days in 276 patients treated in 1932.

largest amount of tissue removed at any one time weighed 48 grams. In the years 1929, 1930, and 1931, only 32.1 per cent of prostate glands removed suprapubically from 575 cases weighed more than 50 grams, so that from the standpoint of size there would seem to be few cases in which this method of treatment is not applicable.

As a whole, the patients are astonishingly free of postoperative complications. Of the 276 patients on whom operation was performed in 1932, only 38.7 per cent had a postoperative temperature higher than 101 degrees Fahrenheit (Fig. 4). The majority of patients (Fig. 5) leave the hospital on the fifth, sixth, or seventh day unless they have previously had a suprapubic cystostomy as preliminary preparation, in which case convalescence is prolonged by the time necessary for healing of the suprapubic fistula. In the last year cystostomy was done forty-four times (15.94 per cent of the cases), because of marked renal impairment or extensive urinary sepsis prior to removal of the obstruction through the urethra.

Bleeding is the most common postoperative complication, and it is the delayed rather than the immediate bleeding which gives the most concern. In the third week bleeding of more or less severity occurred in ten cases. In one patient cystostomy was necessary, and in two patients the loss of blood was severe enough to make transfusion seem advisable. The bladder usually fills rapidly with clots, and when these are emptied it is exceptional that a bleeding point can be found. The effort of the bladder to expel the clots seems to keep up the bleeding, and when they are evacuated the bleeding usually ceases. When the bleeding occurs within the first two or three days following operation, the bleeding point can usually be found and fulgurated. In the first one hundred cases, before this was fully appreciated, cystostomy was performed on two patients for the removal of clots. Since then this has never been necessary except in the case referred to, in which bleeding occurred on the twenty-first day after operation.

The most trouble with bleeding has occurred during the third week, when sloughs incident to fulguration are coming loose. In ten patients (2 per cent) bleeding during this period was severe enough to require the removal of clots by the cystoscope, and transfusions were given twice. In eight patients some bleeding occurred late in convalescence, but not of an amount sufficient to require treatment other than rest and lavage. To summarize, I may say that bleeding has occurred as a complication twenty-eight times (5.21 per cent) among 499 patients, five times as a postoperative complication, fifteen times during convalescence, and eight times after the patient had left the hospital. It has never been a contributory cause to any of the deaths, of which there were seven (1.4 per cent), in the last six years. All deaths were the result of renal or pulmonary infection secondary to trauma and destruction of tissue incident to the operation. No deaths have occurred for more than a year, during which period 291 patients have been operated on by the transurethral method. Since August 1, all but two of the patients with prostatic hypertrophy seen at The Mayo Clinic were treated by this method, and 142

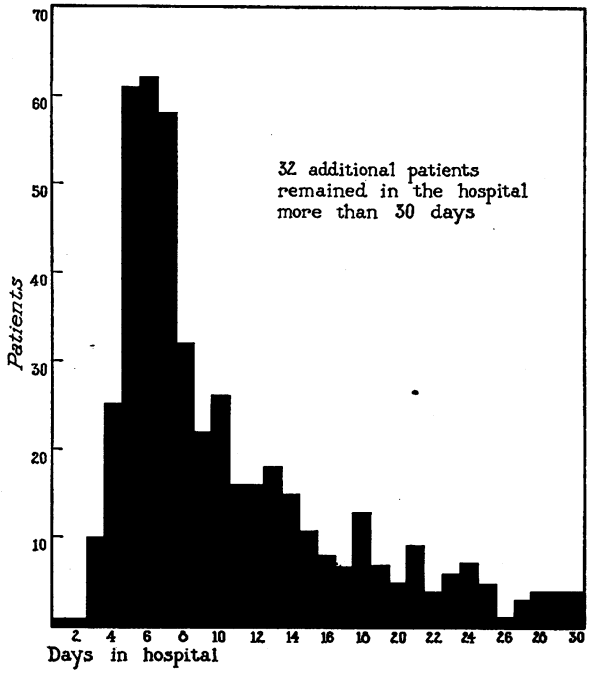

Fig. 5.—Length of postoperative stay in hospital.

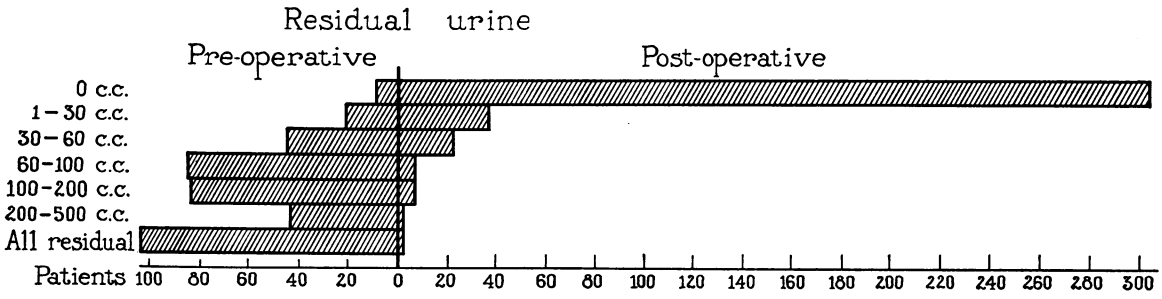

Fig. 6.—Residual urine before and after operation.

of these were given transurethral treatment. Much larger amounts of tissue had been removed from these 142 patients; and many were in such poor condition that prostatectomy had been refused; the patient was given the choice of wearing a suprapubic drain for life or consenting to transurethral removal of the obstruction.

IN CONCLUSION

In conclusion, I would emphasize that if preparation of patients suffering with urinary retention, the result of prostatic obstruction, is reserved for those with impaired renal function and severe infection, and the transurethral removal of the obstruction is substituted for some form of prostatectomy, the final functional results, as demonstrated by the reduction in residual urine (Fig. 6), seem to be equal, if not superior, to those obtained by more radical surgical procedures. Therefore, one hundred years after Guthrie's first efforts at the transurethral correction of prostatic obstruction, we are witnessing the realization of his endeavors, and another dread of advancing years has yielded to the progress of medicine.

The Mayo Clinic.

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